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ACKERMAN, Senior District Judge:

This case presents one facet of a broader, multi-forum dispute between Metrologic Instruments, Inc. ("Metrologic") and Symbol Technologies, Inc. ("Symbol"), two close competitors in the design, development, manufacture, and sale of laser scanning bar code readers. Metrologic accuses Symbol of infringing three of its patents relating to automatically-operated laser bar code readers. With discovery completed, the Court must now determine the meanings of various disputed claims contained in the contested patents in accordance with the instruction of *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 976-79 (Fed. Cir. 1995) (en banc), *aff'd*, 517 U.S. 370 (1996). The Court held a hearing for this purpose on March 27, 2006. Subsequently, and with the consent of counsel, the Court submitted seven supplemental questions to the parties, and the parties filed their respective responses on April 24, 2006. The Court has carefully considered all of the parties' written and oral arguments. In the Opinion that follows, the Court sets forth its constructions of the patent claims in dispute.

I. Background**A. General Principles of the Relevant Technology**

The inventions described by the patents in suit are directed toward automatically-operated laser bar code readers, whose function is to scan and decode bar code symbols. Bar code symbols assume a variety of forms, but are most familiar to the lay public as the UPC bar code symbol commonly found on grocery items. These bar code symbols consist of a series of bars and spaces of contrasting darkness imprinted on a surface; the relative widths of the bars and spaces encode a numerical sequence. That numerical sequence, in turn, corresponds to a useful

piece of information, such as the identity of the grocery item on which the bar code symbol is imprinted. Thus, an operator equipped with a laser bar code reader may quickly retrieve detailed information encoded in the bar code symbol.

Laser bar code readers may be either hand held or fixed mounted. In some readers, the laser beam is off until a sensor detects the presence of an object in the vicinity of the reader. A signal from the sensor then causes the laser beam to turn on, or "initiate," automatically. This general process is known as "object detection" and is a common feature of "automatic" laser bar code readers. Object detection may take place before the laser bar code reader scans an object with the laser beam.

Most laser bar code readers today contain many of the same basic elements. A laser diode emits a laser beam that is directed to a mirror known generally as the "scanning mirror." The scanning mirror is moved by a motor, thereby projecting the beam in a pattern. When the laser beam crosses the bar code symbol, the laser light is reflected off the bar code symbol, with the white spaces reflecting more light than the black bars.

Some of the laser light reflected off of bar code symbols and other objects returns to the bar code reader, where it is detected by a component of the bar code reader known as a photoreceiver. A photoreceiver often consists of a photodiode, a device that converts light energy into an electrical signal. The electrical signal is an electronic representation of the object scanned by the laser beam. When the scanned object is a bar code symbol, the electrical signal represents the bar-and-space pattern.

A bar code reader must be able to differentiate between the laser light reflected by a bar code and the laser light reflected by other objects. The bar code reader accomplishes this task by

performing one or more tests on the electrical signal generated by the photoreceiver. By analyzing the electrical signal in this manner, the bar code reader is able to detect electrical signals representing the bar-and-space pattern of a bar code symbol. This process is known generally as “bar code detection.”

Once the bar code reader has determined that the electrical signal represents a bar code, the bar code reader will proceed to “decode” the bar code in order to recover the encoded information (known as “character data”). Upon a successful decoding, the bar code reader “outputs” the character data to an interface where the operator of the bar code reader may readily retrieve the encoded information. An example of such an interface might be a cash register that rings up the scanned item.

B. History of Parties’ Relationship

Metrologic and Symbol have been two of the leading innovators in the field of laser scanning bar code readers. In the early 1980s, Symbol invented the first hand-held laser scanning bar code reader, the triggered scanner, for which Symbol received several patents. The triggered scanner requires the operator to trigger the device’s operation manually.

In the late 1980s and early 1990s, Symbol brought lawsuits against several of its competitors, including Metrologic, for infringement of its triggered scanner patents. Consequently, Metrologic removed its triggered hand-held scanner from the market and developed a “triggerless,” or automatic, hand-held laser scanning bar code reader, which initiated laser scanning without the use of a manual trigger.

On January 1, 1996, Metrologic and Symbol signed a patent cross-license agreement. The agreement purported to define the parties’ respective rights in various technologies

pertaining to bar code scanners. Although the parties' respective rights under this agreement comprise part of the instant dispute, this issue does not affect the Court's analysis here.

Metrologic now contends that two of Symbol's bar code reader products, the M2000 and LS1900 products, infringe three of Metrologic's patents under which Symbol does not hold licenses. Symbol insists that its products are non-infringing. The parties also dispute the meanings of numerous claims in the three patents in suit. In anticipation of a trial on the infringement issue, this Court has held a pretrial *Markman* hearing in order to ascertain the proper construction of the claims in dispute.

C. General Description of the Relevant Patents

1. The Parent Application of the Patents in Suit

Metrologic filed the first patent application (U.S. Patent App. No. 07/583,421, or the "'421 application") for an automatic laser scanning bar code reader on September 17, 1990. The application ultimately issued as U.S. Patent No. 5,260,553 on November 9, 1993. Metrologic subsequently obtained numerous additional patents, all based in part on the original '421 application. Three of these subsequent patents form the basis of the instant dispute.

All three patents in suit are either continuation¹ or continuation-in-part² patents originating from the same “parent” application, the ‘421 application. The ‘421 application suggests that the main technical obstacle for the automatic bar code reader was replacing the human operator, who controlled the hand-held reader by manually triggering the device’s operation, with a system controller capable of operating the reader in a diverse set of operating conditions. In the ‘421 application, Metrologic identified various features that it wished to incorporate in its bar code readers to accomplish this goal, such as allowing for both short- and long-range detection of bar code symbols located in the vicinity of the reader, and managing the power consumption of the reader in certain configurations. The patents in suit are representative of Metrologic’s efforts in addressing the shortcomings and drawbacks of the prior art.

¹ A continuation application is a second application for the same invention claimed in an earlier application (called the “parent” application) filed by the same inventor and containing the same disclosure as the parent application. If the continuation is filed before the parent application becomes abandoned or patented and makes a specific reference to the parent, the continuation is entitled to the benefit of the date the parent was filed. *See Manual of Patent Examining Procedure* § 201.07 (8th ed. 2005); *see also Applied Materials, Inc. v. Advanced Semiconductor Materials Am., Inc.*, 98 F.3d 1563, 1579 (Fed. Cir. 1996) (“Although there may be some variation in the scope of the claimed subject matter, a continuation application is based solely on the disclosure of a parent application.”); *Renishaw P.L.C. v. Marposs Societa’ Per Azioni*, 974 F. Supp. 1056, 1069 (E.D. Mich. 1997) (“Generally, a continuation application contains the exact same disclosure, specification, and figures of the original patent. The only thing that changes is the claims.”).

² A continuation-in-part application contains a substantial portion of the disclosure as contained in the parent application and is filed before the parent becomes abandoned or patented; however, a continuation-in-part application also includes new subject matter not disclosed in the parent application. The continuation-in-part application is entitled to the benefit of the parent application’s filing date to the extent that they contain common subject matter. *See Manual of Patent Examining Procedure* § 201.08 (8th ed. 2005); *see also Augustine Med., Inc. v. Gaymar Indus., Inc.*, 181 F.3d 1291, 1302 (Fed. Cir. 1999) (“A [continuation-in-part application] contains subject matter from a prior application and may also contain additional matter not disclosed in the prior application. . . . Subject matter that arises for the first time in the [continuation-in-part] application does not receive the benefit of the filing date of the parent application.”).

2. United States Patent 5,939,698

United States Patent No. 5,939,698 (the “698 patent”) originated from three continuation applications of the ‘421 application. The ‘698 patent describes an automatic laser bar code reader having both a hand-held and a stand-supported mode of operation. Of the claims in dispute, claim 1 is an independent claim³ and claim 2 depends from claim 1.

Claim 1 sets forth an automatic hand-held bar code reader with a support stand. The device in claim 1 has five major components, including (1) a housing; (2) a means for producing scan data that consists of a laser beam producing means, a scanning means, and a laser light detecting means; (3) a bar code presence detection means; (4) a symbol decoding means; and (5) system control circuitry. Claim 1 further stipulates a scanner stand. Claim 2 adds a limitation concerning the manner by which the bar code presence detection means of claim 1 detects the presence of a bar code.

3. United States Patent 5,340,971

United States Patent No. 5,340,971 (the “971 patent”) issued from a continuation-in-part application of the ‘421 application and contains additional material in its patent specification.

³ Claims may be independent, dependent, or multiple dependent. An independent claim stands on its own and does not rely on any other claims to define its scope. A dependent claim refers back to an earlier claim and incorporates by reference any limitations (that is, express “boundaries” to the invention) described in that earlier claim. *See Wahpeton Canvas Co. v. Frontier, Inc.*, 870 F.2d 1546, 1553 (Fed. Cir. 1989). To avoid redundancy, the dependent claim must add further limitations over the earlier-referenced claim. *Curtiss-Wright Flow Control Corp. v. Velan, Inc.*, 438 F.3d 1374, 1380 (Fed. Cir. 2006). Multiple dependent claims refer back in the alternative to two or more previous claims and include all limitations described in those claims. *Manual of Patent Examining Procedure* § 608.01(n) (8th ed. 2005). *See generally Jeneric/Pentron, Inc. v. Dillon Co.*, No. 3:98-CV-818, 1999 WL 66537, at *9 (D. Conn. 1999) (discussing the difference between dependent and independent claims), *aff’d*, 205 F.3d 1377 (Fed. Cir. 2000).

The '971 patent describes an automatic laser bar code reader having a mode of operation that allows it to read consecutively different bar code symbols automatically. Of the claims in dispute, claim 44 is an independent claim and claim 46 depends from claim 44.

Claim 44 sets forth a bar code reading device with six components, including (1) a housing, (2) a laser beam producing means, (3) a laser beam scanning means, (4) a laser light detecting means, (5) a scan data processing means, and (6) a control means. Claim 46 adds a limitation concerning the manner by which the scan data processing means of claim 44 detects the presence of a bar code.

4. United States Patent 5,925,870

United States Patent No. 5,925,870 (the "'870 patent") originated from a continuation application of two other continuation-in-part applications of U.S. Patent App. No. 07/761,123 (which itself issued as the '971 patent). The '870 patent describes an automatic laser bar code reader that flickers or blinks the reader's laser beam to increase the visibility of the laser scan line. The only claim in dispute from the '870 patent is independent claim 10.

Claim 10 outlines a bar code reader with eight components, including (1) a housing, (2) a system activation means, (3) a laser beam source, (4) a laser beam directing means, (5) a scanning mechanism, (6) a light detection means, (7) a scan data processing means, and (8) a control means.

II. Principles of Law

A. The *Markman* Hearing

There are two steps in a patent infringement analysis. First, the court must determine the

proper construction, or meaning, of the disputed claim or claims. Second, findings must be made as to whether the accused product or method infringes the asserted claim as properly construed. See *Markman*, 517 U.S. at 377-90. Under *Markman*, claim construction is a matter of law to be decided only by the court, whereas the issue of infringement is a question left to the factfinder. *Id.*

A *Markman* hearing may be held before, during, or after discovery, and even, in theory, during the infringement trial or on post-trial motions. See *Elf Atochem N. Am., Inc. v. Libbey-Owens-Ford Co.*, 894 F. Supp. 844, 850 (D. Del. 1995). Although the Federal Circuit has not mandated a time for conducting *Markman* hearings, courts generally hold them before the infringement trial and after the parties have conducted discovery relating to their respective contentions as to claim construction. Within this District, for instance, it is a common practice for courts to conduct *Markman* hearings after discovery is completed. See, e.g., *Conopco, Inc. v. Warner-Lambert Co. (In re Conopco, Inc.)*, No. Civ. A. 99-101, 2000 WL 342872, at *4 (D.N.J. Jan. 26, 2000) (“[C]ourts have held that *Markman* hearings to determine proper claim construction are inappropriate prior to completion of discovery.”); see also, e.g., *ADC Telecomm., Inc. v. Siecor Corp.*, 954 F. Supp. 820, 821, 826-31 (D. Del. 1997); *S.S. White Burs, Inc. v. Neo-Flo, Inc.*, No. Civ. A. 02-3656, 2003 WL 21250553, at *3 (E.D. Pa. May 2, 2003).

A fundamental principle of claim construction is that patent claims must have the same meaning to all persons at all times, and that the meanings of the claims are determined and fixed at the time the Patent and Trademark Office (“PTO”) issued the patent. See *SmithKline Beecham Corp. v. Apotex Corp.*, 403 F.3d 1331, 1338 (Fed. Cir. 2005) (en banc) (“Claim interpretation requires the court to ascertain the meaning of the claim to one of ordinary skill in the art at the

time of invention.”). The purpose of a *Markman* hearing is for the court and the parties to settle conclusively on the interpretation of disputed claims. See *Elf Atochem*, 894 F. Supp. at 850, 857-58. Indeed, the need for uniformity of claims’ construction and concerns about fairness to competitors inform the policy of reserving the claim-construction function to the trial judge. See *Markman*, 52 F.3d at 987 (“The more appropriate analogy for interpreting patent claims is the statutory interpretation analogy. Statutory interpretation is a matter of law strictly for the court. There can be only one correct interpretation of a statute that applies to all persons.”).

In some instances, claim construction may be dispositive of the entire case because the likelihood of success for one side is greater on the issue of infringement based on the court’s construction. See *Nystrom v. Trex Co.*, 424 F.3d 1136, 1140-41 (Fed. Cir. 2005) (“Based on the district court’s claim construction ruling, Nystrom conceded that he could not prove his infringement case against TREX.”). In those cases, the court’s and the litigants’ resources may be saved by consenting to judgment. Even if the claim construction is not dispositive of the case, it will lay the groundwork for the ensuing infringement trial.

B. General Principles of Claim Construction

In interpreting a disputed claim, the court looks primarily to the intrinsic evidence in the record, “i.e., the patent itself, including the claims, the specification and, if in evidence, the prosecution history.” *Vitronics Corp. v. Conceptiontronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996) (citing *Markman*, 52 F.3d at 979). Intrinsic evidence is the “most significant source of the legally operative meaning of disputed claim language.” *Id.* First, the court must look to the words of the claim itself to define the proper scope of the claimed invention. When interpreting the words of the claim, “a court must presume that the terms in the claim mean what they say, and, unless

otherwise compelled, give full effect to the ordinary and accustomed meaning of claim terms.” *Johnson Worldwide Assocs., Inc. v. Zebco Corp.*, 175 F.3d 985, 989 (Fed. Cir. 1999). However, the court will not accord a claim term its ordinary meaning in two situations. “The first arises if the patentee has chosen to be his or her own lexicographer by clearly setting forth an explicit definition for a claim term. The second is where the term or terms chosen by the patentee so deprive the claim of clarity that there is no means by which the scope of the claim may be ascertained from the language used.” *Id.* at 990 (internal citations omitted). In either situation, the court must adopt the proffered definition of a term. *Id.*

Claims “are part of ‘a fully integrated written instrument,’” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1315 (Fed. Cir. 2005) (en banc) (citing *Markman*, 52 F.3d at 978), consisting principally of a written description of the invention, 35 U.S.C. § 112 para. 1, often referred to as the specification,⁴ and concluding with the claims, *id.* para. 2. “For that reason, claims ‘must be read in view of the specification, of which they are a part.’” *Phillips*, 415 F.3d at 1315 (quoting *Markman*, 52 F.3d at 979). Thus, the second step in claim construction is for the court “to review the specification to determine whether the inventor has used any terms in a manner inconsistent with their ordinary meaning. The specification acts as a dictionary when it expressly defines terms used in the claims or when it defines terms by implication.” *Vitronics*, 90 F.3d at 1582.

Next to the claim language itself, the specification is the most relevant evidence to any construction analysis. “Usually it is dispositive; it is the single best guide to the meaning of a

⁴ As defined by 35 U.S.C. § 112, the specification of a patent is technically the written description of the disclosed invention plus the claims. 35 U.S.C. § 112 para. 2. However, as used widely by courts and practitioners, the term “specification” herein refers only to the written description of the invention, excluding the claims.

disputed term.” *Id.* In addition to defining terms, the specification “teaches about the problems solved by the claimed invention, the way the claimed invention solves those problems, and the prior art that relates to the invention. These teachings provide valuable context for the meaning of the claim language.” *Eastman Kodak Co. v. Goodyear Tire & Rubber Co.*, 114 F.3d 1547, 1554 (Fed. Cir. 1997), *abrogated on other grounds*, *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1456 (Fed. Cir. 1998) (en banc); *see also Phillips*, 415 F.3d at 1316 (“In light of the statutory directive that the inventor provide a ‘full’ and ‘exact’ description of the claimed invention, the specification necessarily informs the proper construction of the claims.”); 5A-18 Donald S. Chisum, *Chisum on Patents* § 18.03(2)(c) (2006).

The third step in claim construction entails consideration of a patent’s prosecution history. A patent’s prosecution history consists of “the complete record of all the proceedings before the Patent and Trademark Office, including any express representations made by the applicant regarding the scope of the claims.” *Vitronics*, 90 F.3d at 1582. For example, during the application process, a patent examiner may require the applicant to limit the scope of his or her proposed claims so as not to include prior art within their ambit. An applicant may also limit the scope of his or her proposed claims in the process of distinguishing his or her invention over the prior art in order to obtain a patent. When an applicant surrenders or disclaims subject matter in this manner, the disclaimer becomes part of the prosecution history. If the application ultimately issues as a patent, the patent holder is bound by his or her prior disclaimers. *Spectrum Int’l, Inc. v. Sterilite Corp.*, 164 F.3d 1372, 1378 (Fed. Cir. 1998) (“[E]xplicit statements made by a patent applicant during prosecution to distinguish a claimed invention over prior art may serve to narrow the scope of a claim.”). However, the Federal Circuit has said that “for

prosecution disclaimer to attach, our precedent requires that the alleged disavowing actions or statements made during prosecution be both clear and unmistakable.” *Omega Eng’g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1325-26 (Fed. Cir. 2003) (footnote omitted).

In the context of multiple continuation or continuation-in-part patents originating from the same parent patent, “the prosecution history regarding a claim limitation in any patent that has issued applies with equal force to subsequently issued patents that contain the same claim limitation.” *Elkay Mfg. Co. v. Ebco Mfg. Co.*, 192 F.3d 973, 980 (Fed. Cir. 1999). Thus, a claim in a continuation or a continuation-in-part patent may, in addition to being limited by its own prosecution history, be limited because of (1) the prosecution history of its parent patent, and/or (2) the prosecution history of a continuation or continuation-in-part patent from the same parent patent that has issued prior to the patent in question, so long as the patents contain the same claim limitation.

Although a patent’s prosecution history is relevant in construing the patent claims, there is a distinction between construing the claims in light of their prosecution history and applying the doctrine of prosecution history estoppel.⁵ Courts consult the prosecution history of a patent

⁵ The doctrine of prosecution history estoppel “precludes a patent owner in an infringement suit from obtaining a construction of a claim that would in effect resurrect subject matter surrendered during the course of proceedings in the Patent and Trademark Office.” 5A-18 Chisum, *supra*, § 18.05; *see also Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 234 F.3d 558, 564-65 (Fed. Cir. 2000) (en banc) (“The logic of prosecution history estoppel is that the patentee, during prosecution, has created a record that fairly notifies the public that the patentee has surrendered the right to claim particular matter as within the reach of the patent.”), *vacated & remanded on other grounds*, 535 U.S. 722 (2002), *on remand*, 344 F.3d 1359 (Fed. Cir. 2003) (en banc), *cert. denied*, 541 U.S. 988 (2004); *Pharmacia & Upjohn Co. v. Mylan Pharms., Inc.*, 170 F.3d 1373, 1376 (Fed. Cir. 1999) (“Prosecution history estoppel precludes a patentee from obtaining under the doctrine of equivalents coverage of subject matter that has been relinquished during the prosecution of its patent application.”). The actions by the patentee that may give rise to prosecution history estoppel include claim amendments and arguments

during claim construction, while they apply the doctrine of prosecution history estoppel only during trial as a measure of preventing a patentee from improperly benefitting from the doctrine of equivalents.⁶ *Altech Controls Corp. v. E.I.L. Instruments, Inc.*, 71 F. Supp. 2d 677, 680 (S.D. Tex. 1999) (“Prosecution history estoppel imposes a legal limitation on the application of the doctrine of equivalents in excluding from the range of equivalents any subject matter surrendered during the prosecution of the application for the patent”); *see also Wenger Mfg., Inc. v. Coating Mach. Sys., Inc.*, 239 F.3d 1225, 1238 (Fed. Cir. 2001) (“This court has previously stated that the doctrine of prosecution history estoppel is ‘irrelevant’ to the determination of literal claim scope. . . . [W]e recognized a ‘clear line of distinction’ between using prosecution history to construe disputed claim language, and applying the doctrine of prosecution history estoppel” (citing *Biodex Corp. v. Loredan Biomedical, Inc.*, 946 F.2d 850, 862 (Fed. Cir. 1991))). The Federal Circuit has cautioned district courts not to confuse “following the statements in the prosecution history in defining a claim term, [with] the doctrine of prosecution history estoppel, which limits expansion of the protection under the doctrine of equivalents.” *Spectrum*, 164 F.3d at 1378 n.2.

made before the Patent Office. *Festo*, 234 F.3d at 564.

⁶ The doctrine of equivalents “allows a patent owner to hold as an infringement a product or process that does not [fall within] the literal terms of a patent’s claim but performs substantially the same function in substantially the same way to obtain the same result as the claimed subject matter.” 5A-18 Chisum, *supra*, § 18.04 (footnote omitted). The doctrine is a response to the difficulties in capturing an invention with words. For a court only to conduct literal infringement analysis and confine an invention strictly to its written application may, in some instances, be unfair to the inventor. The Supreme Court observed in *Festo* that “the nature of language makes it impossible to capture the essence of a thing in a patent application. . . . [It] may not capture every nuance of the invention or describe with complete precision the range of its novelty.” *Festo*, 535 U.S. at 731.

Lastly, although “[i]n most situations, an analysis of the intrinsic evidence alone will resolve any ambiguity in a disputed claim term,” a court may rely on extrinsic evidence, such as expert and inventor testimony, dictionaries, and learned treatises, if an analysis of the intrinsic evidence does not give clarity to a disputed claim term. *Vitronics*, 90 F.3d at 1583. Nevertheless, a court should not rely on extrinsic evidence when the public record unambiguously defines the scope of the claimed invention. “The claims, specification, and file history, rather than extrinsic evidence, constitute the public record . . . on which the public is entitled to rely.” *Id.*

Notwithstanding the disfavored treatment of extrinsic evidence, *Vitronics* instructs that judges may consult technical treatises and dictionaries to gain a better understanding of the underlying technology. *Id.* at 1584 n.6. Judges may even adopt the dictionary definition of terms as long as the definition does not contradict the intrinsic evidence associated with related patent documents. *Id.*

C. Construction of Means-Plus-Function Elements

In addition to the general principles of claim construction, special rules of construction apply to claims that employ so-called means-plus-function language. A means-plus-function claim element describes an invention, or an aspect of an invention, as a general means or step for performing a specifically-defined function. By employing means-plus-function claim language, a patentee may “recite a function to be performed as a claim limitation rather than reciting structure or materials for performing that function.” *Omega Eng’g*, 334 F.3d at 1321. Section 112, paragraph six of Title 35 of the United States Code authorizes the use of means-plus-function terminology in claim drafting.

An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

35 U.S.C § 112 para. 6.

A court will construe claim limitations written in means-plus-function form by utilizing a two-step approach. The court must first identify the claimed function. *Omega Eng'g*, 334 F.3d at 1321. Ordinary principles of claim construction govern the identification of the claimed function and “[t]he court must construe the function of a means-plus-function limitation to include the limitations contained in the claim language, and only those limitations.” *Cardiac Pacemakers, Inc. v. St. Jude Med., Inc.*, 296 F.3d 1106, 1113 (Fed. Cir. 2002). Under general principles of claim construction, there is “a ‘heavy presumption’ that claim terms carry their accustomed meaning in the relevant community at the relevant time,” and this presumption may be overcome only “by clearly using the words in the specification, prosecution history, or both ‘in a manner inconsistent with its ordinary meaning.’” *Genzyme Corp. v. Transkaryotic Therapies, Inc.*, 346 F.3d 1094, 1098 (Fed. Cir. 2003) (quoting *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002), and *Boehringer Ingelheim Vetmedica, Inc. v. Schering-Plough Corp.*, 320 F.3d 1339, 1347 (Fed. Cir. 2003)). Therefore, under general principles of claim construction, the function of a means-plus-function claim is construed according to its “ordinary and accustomed meaning[] unless the patentee demonstrated an intent [in the intrinsic record] to deviate from the ordinary and accustomed meaning of a claim term . . . using words or expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope.” *Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1324, 1327 (Fed. Cir. 2002).

Once the court identifies the function, it must then determine the corresponding structure or structures in the specification that perform the identified function. *Omega Eng'g*, 334 F.3d at 1321; *Med. Instrumentation & Diagnostics Corp. v. Elekta AB*, 344 F.3d 1205, 1210 (Fed. Cir. 2003). A structure is corresponding “only if the specification or the prosecution history clearly links or associates that structure to the function recited in the claim.” *B. Braun Med., Inc. v. Abbott Labs.*, 124 F.3d 1419, 1424 (Fed. Cir. 1997); *see also Icon Health & Fitness, Inc. v. Sportcraft, Ltd.*, 272 F. Supp. 2d 384, 388 (D.N.J. 2003) (“Claim construction of a means-plus-function element requires identification of the function recited in the claim and identification of the structure corresponding to that function as disclosed in the specification.”). Because a means-plus-function claim by definition may not recite structure, the Court looks first to the language of the specification to identify the corresponding structure. *See B. Braun Med.*, 124 F.3d at 1424; *see also Atmel Corp. v. Info. Storage Devices*, 198 F.3d 1374, 1381 (Fed. Cir. 1999) (“[S]tructure supporting a means-plus-function claim under § 112, ¶ 6 must appear in the specification.”).

If necessary, the Court may also consult the patent’s prosecution history. *See Cybor*, 138 F.3d at 1457 (“Prosecution history is relevant to the construction of a claim written in means-plus-function form.”). Just as a patentee may disavow the scope of his or her claims, in the case of claims involving means-plus-function language, he or she may disclaim a particular structure during prosecution. *See Altiris Inc. v. Symantec Corp.*, 318 F.3d 1363, 1375 (Fed. Cir. 2003); *cf. Ballard Med. Prods. v. Allegiance Healthcare Corp.*, 268 F.3d 1352, 1359 (Fed. Cir. 2001) (“When a patentee advises the examiner . . . that a particular structure is not within his invention, the patentee is not permitted to assert in a subsequent infringement action that the

same structure is equivalent . . . for purposes of section 112 paragraph 6.”); *Cybor*, 138 F.3d at 1457 (“Clear assertions made in support of patentability may thus affect the range of equivalents under § 112, ¶ 6.”). However, “[u]nless altering claim language to escape an examiner rejection, a patent applicant only limits claims during prosecution by clearly disavowing claim coverage.” *York Prods., Inc. v. Cent. Tractor Farm & Family Ctr.*, 99 F.3d 1568, 1575 (Fed. Cir. 1996).

Although employment of means-plus-function language may seemingly grant the drafter all the means capable of performing the recited function, this is not the case. Within the framework for construing a means-plus-function clause, the statute limits a means-plus-function element to cover only “the corresponding structure, material or acts described in the specification and equivalents thereof.” 35 U.S.C. § 112 para. 6; *see also Kahn v. Gen. Motors Corp.*, 135 F.3d 1472, 1476 (Fed. Cir. 1998) (“[I]n writing a claim in means-plus-function form, a party is limited to the corresponding structure disclosed in the specification and its equivalents.”). “The duty of a patentee to clearly link or associate structure with the claimed function is the quid pro quo for allowing the patentee to express the claim in terms of function under section 112, paragraph 6.” *Med. Instrumentation*, 344 F.3d at 1211; *see also Bailey v. Dart Container Corp.*, 157 F. Supp. 2d 110, 115 (D. Mass. 2001) (“[T]he ‘cost’ of using means-plus-function language is that the scope of the claim is restricted to the particular structures disclosed in the specification and their equivalents.”).

III. Construction of the Disputed Claims

A. The ‘698 Patent

The parties dispute the interpretation of several elements in claims 1 and 2 of the ‘698 patent. In claim 1, they dispute the construction of the following elements: the “laser beam

producing means” of limitation 1(a)(2)(i); the “laser light detecting means” of limitation 1(a)(2)(iii); the “bar code symbol detection means” of limitation 1(a)(3); the “symbol decoding means” of limitation 1(a)(4); the “housing support means” of limitation 1(b)(1); and the “base portion” of limitation 1(b)(2).

1. Limitation 1(a)(2)(i)

“a laser beam producing means disposed in said hand-supportable housing for producing and projecting a laser beam through said light transmission aperture”

The Federal Circuit has delineated a framework for allowing courts to recognize when a claim drafter has properly invoked the strictures of 35 U.S.C. § 112 para. 6. *See Al-Site Corp. v. VSI Int'l, Inc.*, 174 F.3d 1308, 1318 (Fed. Cir. 1999). If the word “means” appears in the claim in combination with an intended function, a court will presume that the “means” clause is a means-plus-function element to which § 112, ¶ 6 applies. *Id.* However, the drafter may overcome this presumption by reciting sufficient structure or material for performing the claimed function in the “means” clause, because § 112, ¶ 6 governs only claim elements that do not recite structural or material limitations associated with the identified function. *Id.*

The parties agree that limitation 1(a)(2)(i) is a means-plus-function claim element. This Court has independently reviewed the claim language and concludes that, consistent with the foregoing principles, limitation 1(a)(2)(i) utilizes means-plus-function language. Specifically, the claim element recites the term “means” in connection with a function, thus giving rise to the presumption of a means-plus-function claim element. Furthermore, the claim element does not recite structure for performing the recited function so as to rebut the means-plus-function presumption. Accordingly, the Court will construe limitation 1(a)(2)(i) according to the

principles governing means-plus-function claim elements under § 112, ¶ 6.

Having found that limitation 1(a)(2)(i) is a means-plus-function claim element, the Court conducts a two-step analysis to construe this claim element properly. As mentioned above, the Court must first identify the function recited in the claim element. *Omega Eng'g*, 334 F.3d at 1321. Once the function is ascertained, the Court must determine the structure corresponding to that function as disclosed in the specification. *Id.*

a. Function

The parties appear substantially to agree that the claimed function is “producing and projecting a laser beam through said light transmission aperture.” Although Symbol, unlike Metrologic, fails to set forth expressly its proposed construction of the disclosed function, Symbol appears not to contest Metrologic’s straightforward reliance on the plain language of the claim. Under principles of claim construction for means-plus-function claims, “[t]he court must construe the function of a means-plus-function limitation to include the limitations contained in the claim language, and only those limitations.” *Cardiac Pacemakers*, 296 F.3d at 1113. Here, limitation 1(a)(2)(i) expressly states that the laser beam producing means is for “producing and projecting a laser beam through said light transmission aperture.” Accordingly, the Court finds that the recited function is “producing and projecting a laser beam through said light transmission aperture.”

b. Corresponding Structure

i. Normally-Off Visible Laser Diode

The parties have two disputes concerning the corresponding structure. While they agree that the visible laser diode 36 is a corresponding structure, they vigorously contest whether that

visible laser diode is normally off. Symbol urges the Court to construe limitation 1(a)(2)(i) so as to expressly acknowledge the limitation that the visible laser diode is normally off. According to Symbol, the patentees of the '698 patent distinguished their invention by claiming that the normally-off laser was an improvement over prior art that wasted power by blinking the laser during object detection or powering the laser continuously. See '698 Patent col. 2 ll. 10-16, 27-44. Metrologic responds that in distinguishing their own invention over the prior art, the patentees were merely describing one problem that the prior art exhibited when implemented as portable, battery-powered devices. Thus, Metrologic accuses Symbol of seeking to import a limitation from the specification into the claims.

Metrologic is correct that the plain language of limitation 1(a)(2)(i) does not explicitly require a "normally-off" laser. As the Federal Circuit has mandated, however, courts interpreting means-plus-function claims must consult the specification when identifying the structure that corresponds to a given function. *Omega Eng'g*, 334 F.3d at 1321. Here, the specification clearly discloses a normally-off visible laser diode. First, the patentees denigrate the prior art by indicating that prior art devices suffer from "several significant shortcomings and drawbacks," such as requiring the "continuous use of a pulsed laser beam" that "undesirably drains limited power reserves." '698 Patent col. 2 ll. 11, 13, 14-15. The claimed invention purports to "overcome[] the above shortcomings and drawbacks of prior art devices" in part by operating in a "power conserving manner." *Id.* col. 2 ll. 64-65, col. 3 ll 15-16; *see also id.* col. 5 ll. 27-29 (noting that the invention "provides a great degree of versatility in system capability and operation, as well as power conservation"). In conjunction with representations made elsewhere in the specification, these statements suggest that the patentees did not regard the difference

between continuously-on and normally-off lasers as insubstantial. *See Ballard Med. Prods.*, 268 F.3d at 1359 (“Statements detailing the shortcomings of the relevant prior art have often proved useful in construing means-plus-function claims.”); *cf. Vulcan Eng’g Co. v. Fata Aluminum, Inc.*, 278 F.3d 1366, 1374 (Fed. Cir. 2002) (affirming district court’s finding that differences between accused device and corresponding structure described in specification were insubstantial, and thus the devices were equivalent); *cf. also* 35 U.S.C. § 112 para. 6 (extending means-plus-function claim coverage to include structure described in specification “and equivalents thereof”).

Second, a normally-off visible laser diode is the only embodiment of the claimed function that is disclosed in the specification. *See Chiuminatta Concrete Concepts, Inc. v. Cardinal Indus., Inc.*, 145 F.3d 1303, 1308 (Fed. Cir. 1998) (construing corresponding structure in reference to only disclosed preferred embodiment). The specification discloses that the scanning means includes the visible laser diode, ‘698 Patent col. 7 ll. 17-21, and that this scanning means is initially off, *id.* col. 5, ll. 52-57; col. 11 ll. 46-55. This disclosure finds confirmation in Figure 8A, block A, which indicates that during object detection, only the system activation means is on, while the “remainder of system components are off, i.e. scanning means . . .” *Id.* Fig. 8A.

Third, the “Background” section of the specification indicates that one of the objects of the invention is to “determin[e] the presence of an object without enabling the scanning means of the device.” *Id.* col. 3 ll. 26-29. Another object of the invention is to provide a system in which “a wide number of system control operations can be carried out in a power conserving manner, to permit automatic reading of bar code symbols in a variety of diverse applications.” *Id.* col. 3 ll. 14-17. The “versatility” and “power conservation . . . advantages of this control system

architecture” are reflected in the preferred embodiment. *Id.* col. 5 ll. 28-32. Together, these representations clearly indicate that the structure corresponding to the claimed function is a normally-off visible laser diode. *See Honeywell Int’l, Inc. v. ITT Industries, Inc.*, 452 F.3d 1312, 1320 (Fed. Cir. 2006) (holding that specification’s repeated denigration of a particular embodiment was “the equivalent of a disavowal” of subject matter).

Metrologic contends that when the specification speaks of the shortcomings of prior art devices that drain limited power reserves, it refers specifically to battery-powered devices that are not relevant to the instant dispute. However, the desirability of power conservation is not limited to battery-powered devices. *See* ‘698 Patent col. 3 ll. 14-17 (listing desirability of power conservation without mentioning battery-powered applications). Nor does the patent confine its denigration of continuously-on prior art devices to the problem of power drain. For instance, in discussing the shortcomings inherent in the prior art, the patentees note that “the extensive use of a laser beam to perform object and bar code symbol detection functions implicates [the] necessity for laser emission control measures.” *Id.* col. 2 ll. 43-46. Such statements belie Metrologic’s contention that the patentees’ denigration of continuously-on prior art devices “is not even relevant to the claim at issue.” (Metrologic’s Rebuttal Br. 5.)

Metrologic points to nothing in the patent indicating that battery-powered applications are not relevant to the claimed invention. Moreover, simply because the accused infringing devices are not battery-powered should not affect the Court’s construction of the disputed claims. It is axiomatic that a patent’s claims should have the same meaning to all people at all times. *See Markman*, 52 F.3d at 987. A corollary to this principle is that the meaning of a patent’s claims does not depend on the nature of the alleged infringing device. *See id.* (“[T]he subjective

meaning that a patentee may ascribe to claim language is also not determinative.”). Here, the patent clearly signals the importance of power conservation and laser emission control.

Therefore, these qualities are relevant in this dispute.

Metrologic also argues, in supplemental briefing submitted to this Court, that Symbol’s proposed construction impermissibly adds a functional limitation—“normally off”—in violation of the Federal Circuit’s guidance in *Wenger Manufacturing*, 239 F.3d at 1233. Again, the Court disagrees with this characterization. The adjective “normally-off” modifies the noun “visible laser diode,” which together represent a *structural limitation* on the visible laser diode, not a functional limitation. Construing the corresponding structure as requiring a “normally-off visible laser diode” in no way limits the function of “producing and projecting a laser beam through said light transmission aperture.” Thus, for all of the reason discussed above, it is apparent that an important feature of the visible laser diode in the claimed invention is that it is normally off.

ii. Mirror for Projecting

The parties’ second dispute concerns whether the corresponding structure includes a mirror, and if so, whether the mirror is the “scanning mirror.” Metrologic argues that a mirror is necessary to perform the function of “projecting” the laser beam through the light transmission aperture. Symbol responds that, with respect to limitation 1(a)(2)(ii), which is not in dispute, the parties agree that the claimed “scanning means” includes “a scanning mirror.” Thus, according to Symbol, Metrologic’s insistence that a “mirror” be included in the structure corresponding to the laser beam producing means (limitation 1(a)(2)(i)) indicates that under Metrologic’s proposed constructions, *two* mirrors could perform the functions of projecting and scanning the laser beam. Symbol contends that two mirrors are redundant, and that only one mirror—corresponding to the

agreed-upon scanning mirror of the scanning means (limitation 1(a)(2)(ii))—is necessary to perform the projecting and scanning functions.

There is no dispute that at least one mirror is necessary to perform the function of “projecting” the laser beam through the light transmission aperture. The parties further agree, with respect to limitation 1(a)(2)(ii), that “a scanning mirror” performs the function of “scanning a laser beam across a scan field.” (App. of Exs. to Symbol’s Br., Ex. 8 at 1.) Thus, the Court must determine whether this agreed-upon construction is inconsistent with Metrologic’s proposed construction of limitation 1(a)(2)(i) as including a “mirror” for projecting the laser beam.

A structure is corresponding “only if the specification or the prosecution history clearly links or associates that structure to the function recited in the claim.” *B. Braun Med.*, 124 F.3d at 1424. Clearly, limitation 1(a)(2)(i) describes the function of “projecting.” This function cannot be performed without the aid of a mirror. Thus, the ‘698 patent discloses in its specification that while the visible laser diode 36 is the light source, a mirror is used to deflect the laser beam output from the laser diode. ‘698 Patent col. 7 ll. 17-26. Although Metrologic’s proposed construction of limitation 1(a)(2)(i) refers to a “mirror” in generic terms, Metrologic indicates in its opening brief that this mirror is in fact the scanning mirror of limitation 1(a)(2)(ii). (Metrologic’s Opening Br. at 19 (“... the structure corresponding to the function of ‘projecting’ is the mirror attached to the scanning motor (38).”)) The ‘698 patent shows that item 38 is indeed the scanning mirror. ‘698 Patent col. 7 ll. 26; Fig. 1C. From these facts, the Court concludes that as between limitations 1(a)(2)(i) and 1(a)(2)(ii), there is *one* mirror that performs both the functions of “projecting” the laser beam (limitation 1(a)(2)(i)) and “scanning” it across a

scan field (limitation 1(a)(2)(ii)).

As worded, Metrologic's proposed construction of limitation 1(a)(1)(i) as including a "mirror" is ambiguous and admits of the possibility of two mirrors performing the projecting and scanning functions. Because the parties agree that limitation 1(a)(2)(ii) includes "a scanning mirror," and because there is only one mirror that performs the functions of projecting and scanning, the Court will construe limitation 1(a)(2)(i) to include the additional corresponding structure of a "scanning mirror." In this way, the Court ensures the identity of the mirrors corresponding to limitations 1(a)(2)(i) and 1(a)(2)(ii).

For the foregoing reasons, the Court finds that the structure corresponding to the function described in limitation 1(a)(2)(i) is a normally-off visible laser diode and scanning mirror. The Court shall construe limitation 1(a)(2)(i) as follows: "a normally-off visible laser diode and scanning mirror and their structural equivalents for producing and projecting a laser beam through a light transmission aperture when activated."

2. Limitation 1(a)(2)(iii)

"laser light detecting means for detecting the intensity of laser light reflected off said scanned bar code symbol and passed through said light transmission aperture, and automatically producing scan data indicative of said detected light intensity;"

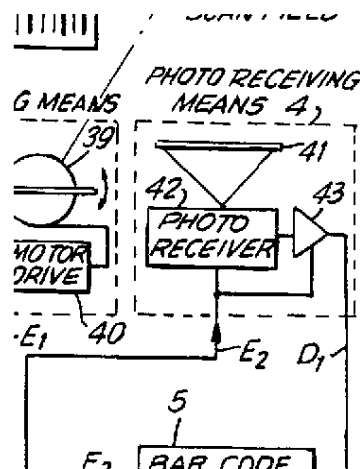
The parties agree that limitation 1(a)(2)(iii) is a means-plus-function claim element. Having independently reviewed the claim language, the Court finds that the language employs the term "means" and does not recite any structure for performing the claimed function. In accordance with Federal Circuit guidance, the Court concludes that limitation 1(a)(2)(iii) is a means-plus-function claim element.

a. Function

Both parties essentially agree that the function recited in limitation 1(a)(2)(iii) is “detecting the intensity of laser light reflected off of a bar code symbol and [] automatically producing scan data indicative of the detected light intensity.” (Metrologic’s Br. 20; *see also* Symbol’s Br. 8 (characterizing the function as “detecting and producing”).) This construction comports with the plain language of the claim. Therefore, the Court finds that the function recited by limitation 1(a)(2)(iii) is “detecting the intensity of laser light reflected off of a bar code symbol and automatically producing scan data indicative of the detected light intensity.”

b. Corresponding Structure

Both parties agree that a photoreceiver is required to carry out the first part of the function of “detecting the intensity of laser light reflected off of a bar code symbol.” The only controversy here is whether an additional preamplifier is needed to perform the function of “automatically producing scan data indicative of the detected light intensity.” Metrologic contends that one is needed. Symbol, by contrast, maintains that the function of “automatically producing scan data indicative of the detected light intensity” can be performed by the photoreceiver alone.



Photoreceiving Means of Figure 2

This dispute essentially centers on the proper meaning of the term “scan data indicative of the detected light intensity.” Because the proper meaning is not apparent from the plain language of the claims, the Court must consult the specification for a definition. *Vitronics*, 90 F.3d at 1582. The specification clearly indicates that upon detecting reflected laser light, the “photo receiving means 4 produces an analog data signal D₁.” ‘698 Patent col. 7 ll. 47-48. Photoreceiving means 4 is defined to include, *inter alia*, a photoreceiver and a preamplifier. *Id.* col. 7 ll. 48-55; Fig. 2. Although the specification teaches that “an analog signal indicative of the intensity of the scan data signal” passes from the photoreceiver to the preamplifier, *id.* col. 7 ll. 52-54, the patent does not define this signal as itself being “scan data.” Rather, the specification teaches only that this unnamed signal is “*indicative of . . . the scan data signal.*” *Id.* (emphasis added).

The significance of this distinction is apparent. As noted above, limitation 1(a)(2)(iii) claims the function of producing “*scan data* indicative of the detected light intensity.” Thus, to perform the given function, it is necessary that a signal properly defined by the patent as “scan data” be produced. The only signal produced by any component of photoreceiving means 4 that the specification expressly defines as “scan data” is “analog scan data signal D₁.” *Id.* col. 7 l. 55. As noted above, this signal is generated by photoreceiving means 4, which includes both the photoreceiver and the preamplifier. It therefore follows that the structure that corresponds to the function of “automatically producing scan data indicative of the detected light intensity” is a photoreceiver working in tandem with a preamplifier.⁷

⁷ As will be discussed below, all three patents-in-suit involve a similar dispute with regard to whether a preamplifier is needed in the laser light detecting means. Since all three patents-in-suit originated from the same parent application and share similar disclosures,

For the above reasons, the Court finds that the corresponding structure is a photoreceiver and a preamplifier. The Court also finds that limitation 1(a)(2)(iii) shall be construed as follows: “a photoreceiver and a preamplifier and their structural equivalents for detecting the intensity of laser light reflected off of a bar code symbol and automatically producing scan data indicative of the detected light intensity.”

3. Limitation 1(a)(3)

“bar code symbol detection means in said hand-supportable housing, for processing produced scan data so as to detect said scanned bar code symbol and automatically generate activation control signal in response to the detection of said scanned bar code symbol;”

The parties agree that limitation 1(a)(3) is a means-plus-function claim element. Having independently reviewed the claim language, the Court finds that the language employs the term “means” and does not recite any structure. Thus, the Court concludes that limitation 1(a)(3) is a means-plus-function claim element.

a. Function

Metrologic suggests that the claim element discloses the functions of (1) “processing produced scan data so as to detect said scanned bar code symbol” and (2) “automatically generat[ing an] activation control signal in response to the detection of said scanned bar code symbol.” (Metrologic’s Br. 21 (alteration in original).) Symbol does not appear to contest this interpretation. The Court notes that Metrologic’s proposed construction converts the verb “generate” into its present participle “generating,” thereby altering the meaning of the claim to

particularly with respect to the laser light detecting means, the Court will accord a consistent construction of the laser light detecting means for all three patents-in-suit. The parties agree on this point. (See Metrologic’s Answers to Supplemental Questions 5; *Markman* Hr’g Tr. 95:18-96:6.)